

I claim:

1. A process for the extraction of an unwanted liquid from a fluid comprising:  
introducing an immiscible extraction liquid into a fluid having an unwanted liquid therein  
to form a physical emulsion comprising a plurality of extraction liquid droplets and the fluid;  
allowing the plurality of extraction liquid droplets to form a polar interaction with the  
unwanted liquid in the fluid to cause the extraction liquid droplets to form into a plurality of  
microdispersed droplets containing the unwanted liquid;  
capturing the microdispersed droplets;  
coalescing the microdispersed droplets into larger droplets containing the unwanted  
liquid; and  
separating the larger droplets containing the unwanted liquid from the fluid.
2. The process of claim 1 wherein the step of introducing an immiscible extraction liquid  
into a fluid having an unwanted liquid comprises introducing an immiscible extraction liquid into  
a fluid stream having an unwanted liquid.
3. The process of claim 1 wherein the step of introducing an immiscible extraction liquid  
into a fluid having an unwanted liquid comprises introducing an immiscible extraction liquid into  
a silicone fluid having an unwanted liquid.
4. The process of claim 1 wherein the step of introducing an immiscible extraction liquid  
into a fluid having an unwanted liquid comprises introducing an immiscible extraction liquid into  
a fluid having an unwanted acid.

5. The process of claim 1 wherein the step of introducing an immiscible extraction liquid into a fluid having an unwanted liquid comprises introducing water droplets into a fluid having an unwanted liquid.

6. The process of claim 1 wherein the step of introducing an immiscible extraction liquid into a fluid having an unwanted liquid comprises introducing water droplets into a silicone fluid having an unwanted acid.

7. The process of claim 1 including the step of controlling an amount of immiscible extraction liquid introduced into the fluid such that there is a specific gravity difference of at least 0.01 between the larger droplets and the fluid.

8. The process of claim 1 wherein the step of capturing the microdispersed droplets comprises capturing the microdispersed droplets with a porous medium.

9. The process of claim 8 wherein the step of capturing the microdispersed droplets with a porous medium comprises capturing the microdispersed droplets with a conical shaped, a cylinder shaped or a frustum shaped porous medium.

10. The process of claim 9 including the step of directing a flow of a fluid stream having an unwanted liquid from an interior of said porous medium through said porous medium to an exterior of said porous medium.

11. The process of claim 8 including the step of orientating the porous medium vertically such that the larger droplets and the fluid exits the porous medium in a direction that is substantially parallel to a direction in which the volume of polar liquid was initially introduced into the fluid.

12. The process of claim 8 including the step of orientating the porous medium horizontally such that the larger droplets and the fluid exits the porous medium in a direction that is substantially perpendicular to each other.

13. A process for the extraction of an acid from a fluid comprising the steps of:  
introducing a volume of polar liquid into a fluid containing an acid;  
forming a stable physical emulsion comprising a plurality of polar liquid droplets dispersed through out the fluid, said polar liquid droplets attractable to the acid in the fluid through a polar interaction to form a plurality of polar liquid acid droplets;  
capturing the polar liquid acid droplets;  
coalescing the polar liquid acid droplets into a plurality of larger droplets containing the acid; and  
separating the larger droplets from the fluid to thereby remove the acid from the fluid.

14. The process of claim 13 wherein the step of introducing a volume of polar liquid into a fluid containing an acid comprises introducing a volume of water into a fluid containing an acid.

15. The process of claim 13 wherein the step of introducing a volume of polar liquid into a fluid containing an acid comprises introducing a volume of polar liquid into a silicone fluid containing an acid.

16. The process of claim 13 wherein the step of separating the larger droplets from the fluid comprises separating the larger droplets from the fluid by a liquid-liquid separation device.

17. The process of claim 13 wherein the step of coalescing the microdispersed droplets into larger droplets containing the acid comprises capturing and then coalescing the polar liquid acid droplets into larger droplets containing the acid by the use of a porous medium.

18. The process of claim 13 wherein the step of forming a stable physical emulsion comprising a plurality of polar liquid droplets dispersed through out the fluid comprises forming a stable physical emulsion comprising a plurality of polar liquid droplets under 10 micron in diameter dispersed through out the fluid.

19. The process of claim 13 wherein the step of forming a stable physical emulsion comprising a plurality of polar liquid droplets dispersed through out the fluid comprises forming a stable physical emulsion comprising a plurality of polar liquid droplets under 1 micron in diameter dispersed through out the fluid.

20. The process of claim 13 wherein the acid comprise a sulfuric acid, a trimethylsulfonic acid, or a hydrochloric acid.

21. The process of claim 13 including the step of controlling an amount of water added to the fluid such that there is a specific gravity difference of at least 0.01 between the plurality of larger droplets containing the acid and the fluid.

22. The process of claim 13 wherein the step of introducing a volume of polar liquid into a fluid containing an acid comprises introducing a volume of polar liquid into a hydrocarbon fluid containing an acid.

23. The process of claim 13 wherein the step of introducing a volume of polar liquid into a fluid containing an acid comprises introducing a volume of polar liquid into a fluid stream containing an acid.

24. The process of claim 17 wherein the step of capturing the microdispersed droplets with a porous medium comprises capturing the microdispersed droplets with a conical shaped, a cylinder shaped or a frustum shaped porous medium.

25. The process of claim 17 including the step of directing a flow of a fluid stream having an unwanted liquid from an interior of said porous medium through said porous medium to an exterior of said porous medium.

26. The process of claim 17 including the step of orientating the porous medium vertically such that the larger droplets and the fluid exits the porous medium in a direction that is

substantially parallel to a direction in which the volume of polar liquid was initially introduced into the fluid.

27.. The process of claim 17 including the step of orientating the porous medium horizontally such that the larger droplets and the fluid exits the porous medium in a direction that is substantially perpendicular to each other.

28. A process for the extraction of an acid from a fluid comprising of the steps of:  
introducing a volume of water into a silicone fluid stream containing an acid;  
forming a stable emulsion comprising a plurality of water droplets under 10 micron in diameter dispersed throughout the silicone fluid stream, said plurality of water droplets attractable to the acid in the silicone fluid through a hydrophilic interaction to form a plurality of water-acid droplets in the silicone fluid stream;  
capturing the plurality of water-acid droplets;  
directing the silicone fluid stream containing the plurality of water-acid droplets through a coalescer comprising a porous medium;  
coalescing the plurality of water-acid droplets into a plurality of larger water-acid droplets, said larger water-acid droplets gravitationally separable from the silicone fluid;  
controlling the volume of water added such that there is a specific gravity difference of at least 0.01 between the larger water-acid droplets and the silicone fluid; and  
separating the larger water-acid droplets from the silicone fluid to thereby remove the acid from the silicone fluid.

29. The process of claim 28 wherein the step of introducing a volume of water into a silicone fluid stream containing an acid comprises introducing a volume of water containing a buffer into a silicone fluid stream containing an acid

30. A process for the extraction of an unwanted liquid from a fluid comprising:  
introducing an immiscible extraction liquid into a fluid having an unwanted liquid therein to form a physical emulsion comprising a plurality of extraction liquid droplets and the fluid;  
allowing the plurality of extraction liquid droplets to form a polar interaction with the unwanted liquid in the fluid to cause the extraction liquid droplets to form into a plurality of coalesceable droplets containing the unwanted liquid;  
capturing the coalesceable droplets using a porous medium with fibers having a diameter substantially the same or less than the coalesceable droplets;  
coalescing the coalesceable droplets into larger droplets containing the unwanted liquid;  
and  
separating the larger droplets containing the unwanted liquid from the fluid.

31. The process of claim 30 including the step of controlling an amount of immiscible extraction liquid introduced into the fluid such that there is a specific gravity difference of at least 0.01 between the larger droplets and the fluid.

32. The process of claim 30 wherein the step of capturing the coalesceable droplets using a porous medium comprises capturing the coalesceable droplets using a conical shaped, a cylinder

shaped or a frustum shaped porous medium with fibers having a diameter substantially the same or less than the coalesceable droplets

33. A process for the extraction of an acid from a fluid comprising of the steps of:
- introducing a volume of water into a silicone fluid stream containing an acid;
  - forming a stable emulsion comprising a plurality of water droplets under 10 micron in diameter dispersed throughout the silicone fluid stream, said plurality of water droplets attractable to the acid in the silicone fluid through a hydrophilic interaction to form a plurality of water-acid droplets in the silicone fluid stream;
  - capturing the plurality of water-acid droplets;
  - directing the silicone fluid stream containing the plurality of water-acid droplets through a coalescer comprising a conical shaped, a cylinder shaped or a frustum shaped porous medium;
  - coalescing the plurality of water-acid droplets into a plurality of larger water-acid droplets, said larger water-acid droplets gravitationally separable from the silicone fluid;
  - controlling the volume of water added such that there is a specific gravity difference of at least 0.01 between the larger water-acid droplets and the silicone fluid; and
  - separating the larger water-acid droplets from the silicone fluid to thereby remove the acid from the silicone fluid.

34. A process for the extraction of an acid from a fluid comprising of the steps of:
- introducing a volume of water into a silicone fluid stream containing a buffer and an acid;
  - forming a stable emulsion comprising a plurality of water droplets under 10 micron in diameter dispersed throughout the silicone fluid stream, said plurality of water droplets



attractable to the acid in the silicone fluid through a hydrophilic interaction to form a plurality of water-acid droplets in the silicone fluid stream;

capturing the plurality of water-acid droplets;

directing the silicone fluid stream containing the plurality of water-acid droplets through a coalescer comprising a conical shaped, a cylinder shaped or a frustum shaped porous medium;

coalescing the plurality of water-acid droplets into a plurality of larger water-acid droplets, said larger water-acid droplets gravitationally separable from the silicone fluid;

controlling the volume of water added such that there is a specific gravity difference of at least 0.01 between the larger water-acid droplets and the silicone fluid; and

separating the larger water-acid droplets from the silicone fluid to thereby remove the acid from the silicone fluid.